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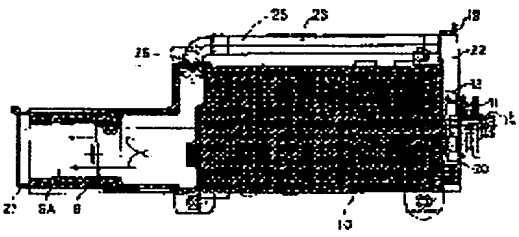
(54) SEWING MACHINE WITH DUST COLLECTOR

(57)Abstract:
PROBLEM TO BE SOLVED: To improve sewing capability and quality of the sewing processed by this sewing machine by preventing occurrence of malfunctions due to accumulation of dust, such as malsewing, deforming movable parts, parts break downs and so on, utilizing air stream from a cooling fan originally installed to cool lubricant, without basically reforming the machine and exerting cooling function for movable parts.
SOLUTION: A cooling air separator 22 to separate a portion of cooling air generated by a cooling fan 18 which is placed and fixed at a lower part of a base 10 of a machine head 9. The separator 22 is formed on a perimeter part of the cooling fan 28. A portion of cooling air stream separated by this cooling air separator 22 is lead into an inside 9A of the machine head 9 and an air stream duct 25 is installed to collect dust to a prescribed point.



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(57)【要約】
【課題】 大幅な改造を要することなく、潤滑油の冷却のために本来設けられている冷却用ファンが発生する空気流を有効に活用して、塵埃の蓄積に伴う縫製不良や可動部品の変形、破損等の不良事態の発生防止機能及び可動部品に対する冷却機能も発揮させて縫製性能および縫製品質の向上を図れるようにする。
【解決手段】ミシンベッド部9の基部10の下方に配置固定されたオイルパン13を冷却するための冷却用空気流を発生する冷却用ファン18により発生される冷却用空気流の一部を分離させる冷却用空気流分離部22が冷却用ファン18の外周部に形成され、この冷却用空気流分離部22で分離された一部の冷却用空気流をミシンベッド部9の内部9Aに導入して該ミシンベッド部9内の塵埃を所定箇所に集合させる空気流導入路25を設けている。

【特許請求の範囲】
【請求項1】ミシン本体の下部に位置され、その上面部には針板が装着されているとともに、内部に縫いを構成する部品が収納されているミシンベッド部と、このミシンベッド部の基部下方に配置固定された潤滑油収納部と、上記ミシンベッド部の基部側方へ突出させて、その突出部にミシンプーリが固定されたミシン主軸と、このミシン主軸に上記ミシンプーリと一体回転可能に固定されて、上記潤滑油収納部へ冷却用空気流を送給する冷却用ファンとを備えてなるミシンにおいて、上記

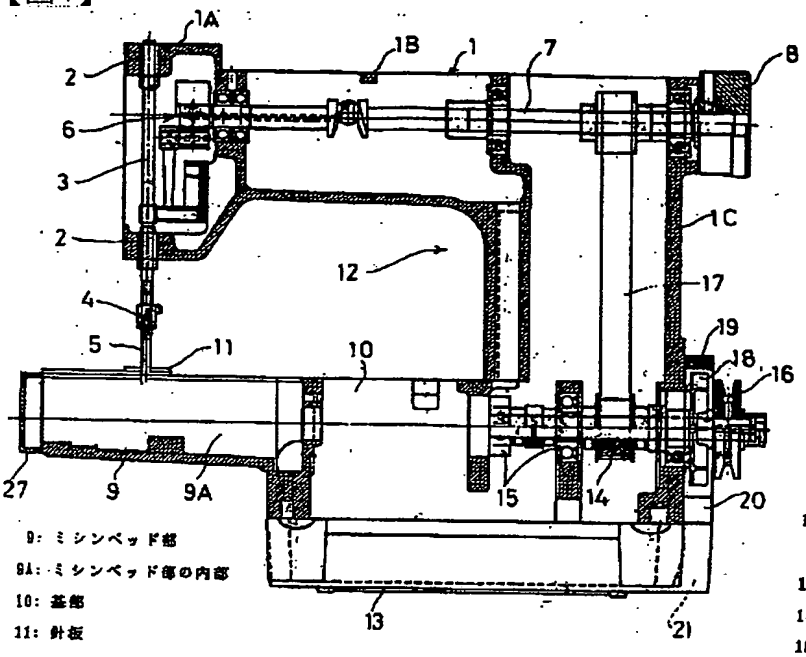
詳細な説明

【発明の詳細な説明】
【0001】
【発明の属する技術分野】本発明は除塵装置付きミシンに関するもので、詳しくは、例えば筒状ベッド型ミシンや平型ベッドミシンによる偏平縫いなどの縫製時に発生する糸くずや布くず等の塵埃が針板の下方部に蓄積されることによる縫製不良や部品の破損等の発生を防止するようにした除塵装置付きミシンに関するものである。
【0002】
【従来の技術】ミシンによる縫製時に発生する糸くず等の塵埃が、上面部に針板を有し内部にルーパや布送り機構、メス機構等の縫いを構成するための部品が収納されているミシンベッド部の内部の特に針板の下方部に蓄積すると、針糸ループが所定どおりに形成されず目飛びなどの縫製不良を起こしやすく、また、それが進行すると蓄積塵埃が針やルーパ等の可動部品と干渉してそれら可動部品を変形したり損傷するなどの不良事態を招くことになる。このような縫製不良や不良事態の発生を防止するために、エアーガンを用いて手動でミシンベッド部に空気を吹き付けて塵埃を飛散除去することが考えられるが、この場合は、縫製中に度々ミシンの作動を中断して空気を吹き付けるといった手数のかかる面倒な清掃作業が必要であるばかりでなく、縫製能率の低下を招きやすく、さらに空気の吹き付けに伴って飛散された塵埃がミシンの周囲に立ち籠って作業環境を悪化するという問題もある。
【0003】また、実開平1－86987号公報や実開平1－121578号公報、実開平6－72579号公報等に開示されているように、ミシンベッド部内に真空ポンプや吸引ブロワなどの吸引装置に接続させたダクトやパイプの一端吸引口を開口接続させることにより、縫製時にミシンベッド部で発生する塵埃を吸引させて該塵埃をミシンベッド部内から除去するようにしたものも多数知られている。しかし、これら吸引式除塵装置の場合は、吸引装置及びその駆動源をミシンと別個に設置する必要があって、設備全体が非常に大掛かりで高価なものになるという問題がある。
【0004】上記のごとき諸問題を克服したミシンとして、米国特許第5，454，338号明細書に開示されたような構成のものが提案されている。この米国特許第5，454，338号明細書に開示されたミシン（以下、先行技術と称する）は、要約すると、ミシン内部を潤滑する潤滑油を冷却するためのオイルクーラのラジエータに対して外部空気を強制的に通過流動させるファンを設け、このファンによって発生されてオイルクーラのラジエータに通過流動させた後の空気流をミシン内部に導くことにより、ミシン内部を正圧に保持させて糸くずなどの塵埃がミシン内部に侵入することを防止させるように構成したものである。
【0005】
【発明が解決しようとする課題】上記のような構成の先行技術によると、潤滑油を冷却するためにミシンが本来的に備えているオイルクーラ用ファンによって発生される空気流を利用してミシン内部への塵埃の侵入防止機能を発揮させることが可能であるから、上述した手動式除塵のように縫製中にミシン作動を中断して空気を吹き付けるといった面倒で手数のかかる、かつ、縫製能率の低下を招く清掃作業が不要であり、また、上述の吸引式除塵装置に比べて、装置全体の小型化、省スペース化および低コスト化を図りつつ、塵埃の蓄積に伴う縫製不良や可動部品の変形、破損といった不良事態の発生を防止することができるという利点を有する。
【0006】しかしながら、上記先行技術の場合は、オイルクーラ用ファンによって発生される空気流をオイルクーラのラジエータに通過流動させた後、ミシン内部に導くものであるから、オイルクーラ用ファンおよびラジエータの配置やそのラジエータを通過流動後の空気流をミシン内部に導くための管路の形成などのためにミシンを大幅に改造する必要があり、また、ミシン内部に導入される空気流がラジエータとの熱交換により加熱された空気流であるために、縫製作動に伴う摩擦等によって次第に温度上昇する傾向にある針やルーパなどの可動部品の温度上昇を促進し、それが原因で針やルーパなどと接触状態にある糸が熱によって不測に切断されやすいという問題があった。
【0007】本発明は上記のような実情に鑑みてなされたもので、大幅な改造を要することなく、潤滑油の冷却のために本来設けられている冷却用ファンにより発生される空気流を有効に活用して、塵埃の蓄積に伴う縫製不良や可動部品の変形、破損といった不良事態の発生を防止することができるとともに、可動部品に対する冷却機能も発揮させて縫製性能および縫製品質の向上を図ることができる除塵装置付きミシンを提供することを目的としている。
【0008】

【0014】13は上記基部10の下面側に配置固定された潤滑油収納部(一般にオイルパンと呼称されるもので、以下、オイルパンと記載する)であり、後述する冷却用空気流との間接熱交換によって収納潤滑油を冷却保持するように構成されている。14は上記ミシンベッド部9の基部10内に軸受15を介して回転自在に支承されたミシン主軸であり、その右端部は右側方へ突出されており、その突出右端部に図外のモータによる駆動回転力を受動するミシンプーリ16が固定されている。このミシン主軸14と上記駆動用上軸7とはタイミングベルト17を介して連動連結されている。
【0015】18は上記ミシン主軸14に上記ミシンプーリ16と一体回転可能に固定された冷却用ファンであり、図1～図4に示すように、右側方に向けて開放させて上記ファン18の外周を取り囲むファンケーシング19が上記ミシンベッド部9の基部10の右側方で上記ミシンアーム部1の基端部1Cの後面に取り付けられ、このファンケーシング19により形成される冷却用空気流通路20が上記オイルパン13の後部に形成された空気流受入部21に連通接続されており、これによって、上記ファン18の回転により発生された冷却用空気流が図4R>4の矢印aに示すように上記空気流受入部21を経て上記オイルパン13に送給されて潤滑油を間接熱交換により冷却するように構成されている。
【0016】上記ファンケーシング19により形成される冷却空気流通路20には図3および図4に明示するように、上記ファン18の回転により発生される冷却用空気流の一部を図4の矢印bで示すように後方へ分離させる冷却用空気流分離部22が連通形成されている。この冷却用空気流分離部22の側端部には上記ミシンベッド部9の基部10の背面外部に沿って配設されたパイプ23の基端部が開口接続されていると共に、該パイプ23の先端部が上記ミシンベッド部9の基端近くの背面部に気密用フランジ26を介して開口接続されており、このパイプ23により上記冷却用空気流分離部22で分離された一部の冷却用空気流を上記ミシンベッド部9の内部9Aに導入する空気流導入路25が構成されている。なお、27は上記ミシンベッド部9の先端部に開閉自在に取り付けられたカバーである。
【0017】上記のように構成された除塵装置付き筒状ベッド型3本針偏平縫いミシンにおいては、図外のモータによる駆動回転力がミシンプーリ16を介してミシン主軸14に伝達されると共に、このミシン主軸14の回転力がタイミングベルト17を介して駆動用上軸7に伝達され、これによって、針棒駆動機構6を介して上記針棒3が上下に往復駆動運動されて針5が上下方向に往復運動すると同時に、ミシンベッド部9内に収納されているルーパ、布送り機構等の縫いを構成するための部品が作動して所定の縫製が行なわれる。この縫製時において、上記ミシン主軸14の駆動回転に伴いミシンプーリ16と一体回転する冷却用ファン18により冷却空気流通路20内に発生される冷却用空気流のうちの主流は、図4の矢印aに示すように、通常どおり空気流受入部21を経て上記オイルパン13に送給され、潤滑油との間接熱交換により潤滑油を冷却することになる。
【0018】一方、上記ファン18の回転に伴い冷却空気流通路20内に発生される冷却用空気流の一部は、図4R>4の矢印bで示すように、側方の冷却用空気流分離部22に分離された後、その分離された一部の冷却用空気流はパイプ23内の空気流導入路25を通してミシンベッド部9の内部9Aに導入されて、該内部9Aを図3の矢印cで示すようにミシンベッド部9の先端部方向へ向かって流動し、ミシンベッド部9の先端部と開閉カバー27との間に形成されている微小な隙間から外部に漏れ出すことになる。このようなミシンベッド部9の内部9Aにおける一部の冷却用空気流のミシンベッド部9の先端部方向への流動および先端側の隙間から外部への漏れ出しによって、縫製時に発生しミシンベッド部9内に侵入してくる糸くず等の塵埃は該ミシンベッド部9内の先端の隙間付近に集合されて針板11の下方部からは除去される。これによって、針板11の下方部に塵埃が蓄積されることに伴う縫製不良の発生および針やルーパ等の可動部品と蓄積塵埃との干渉による可動部品の変形や破損等の不良事態の発生を防止することが可能であるばかりでなく、そのような集塵機能を果たす空気流が冷却用ファン18により発生される温度の低い空気流であるから、縫製作動に伴う摩擦等によって次第に温度上昇する傾向にある針やルーパなどの可動部品に対する冷却機能も発揮してそれら可動部品と接触する糸が熱によって不測に切断されるなどのトラブルの発生も防止することが可能である。
【0019】また、潤滑油の冷却のためにこの偏平縫いミシンが本来的に備えているところの上記冷却用ファン18により発生される冷却用空気流の一部を分離させてミシンベッド部9内に導入する形態としたので、オイルクーラのラジエータに通過流動後の全ての冷却用空気流をミシン内部に送り込むようにしている上記先行技術のものに比べてミシン全体の改造が少なくてすみ、冷却用ファン18の外周を取り囲むように設置されて冷却空気流通路20を形成するファンケーシング19にその冷却空気流通路20に連通接続される空気流分離部22を形成することと、この空気流分離部22およびミシンベッド部9に接続される空気流導入路25を形成するためのパイプ23を新た

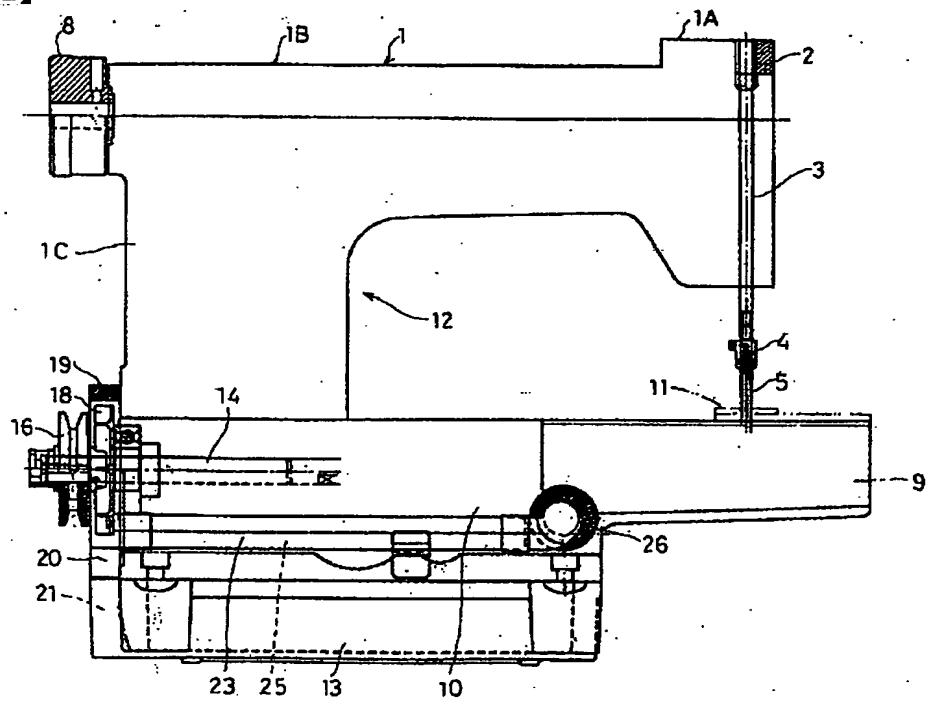
図面

【図1】

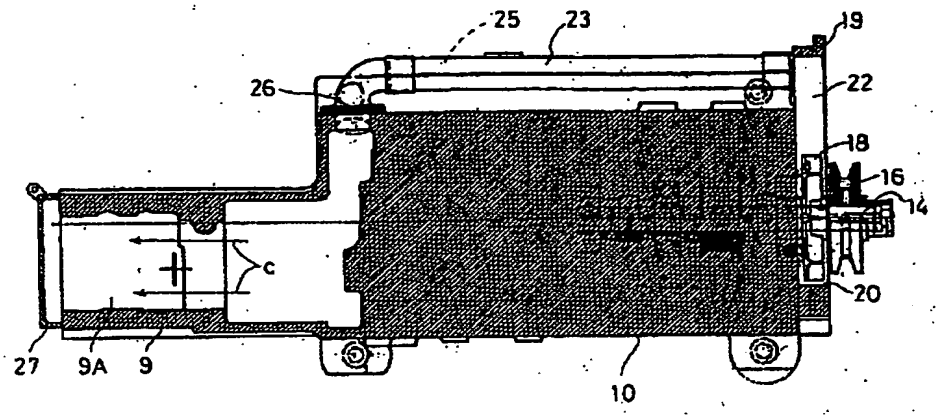


9: ミシンベッド部
9A: ミシンベッド部の内部
10: 基部
11: 針板
12: ミシン本体
13: オイルパン（潤滑油収納部）
14: ミシン主軸
16: ミシンプーリ
18: 冷却用ファン

【図2】

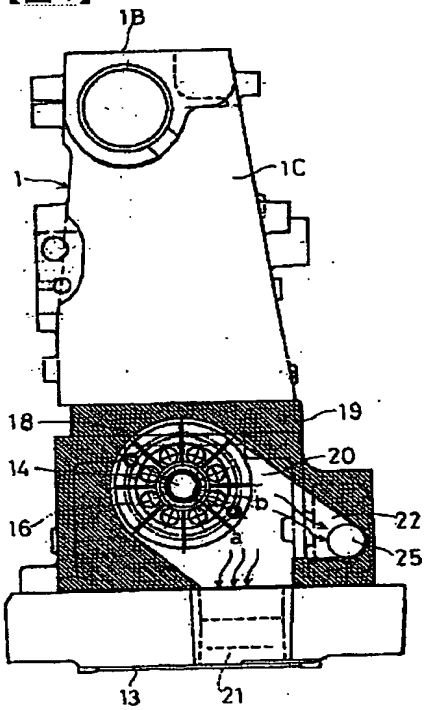


【図3】

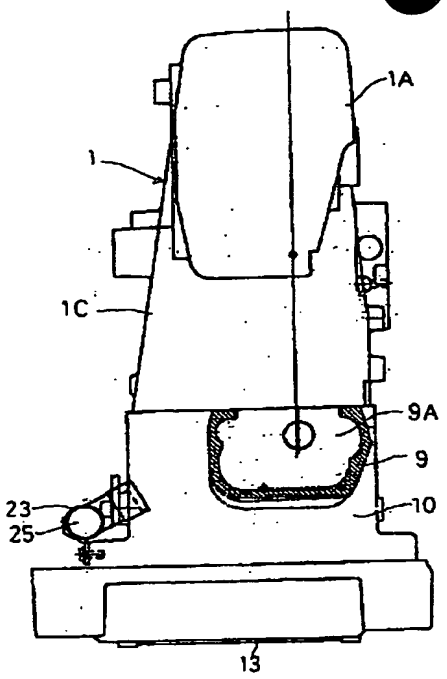


２２：冷却用空気除分離部
２３：パイプ
２５：空気誘導入路

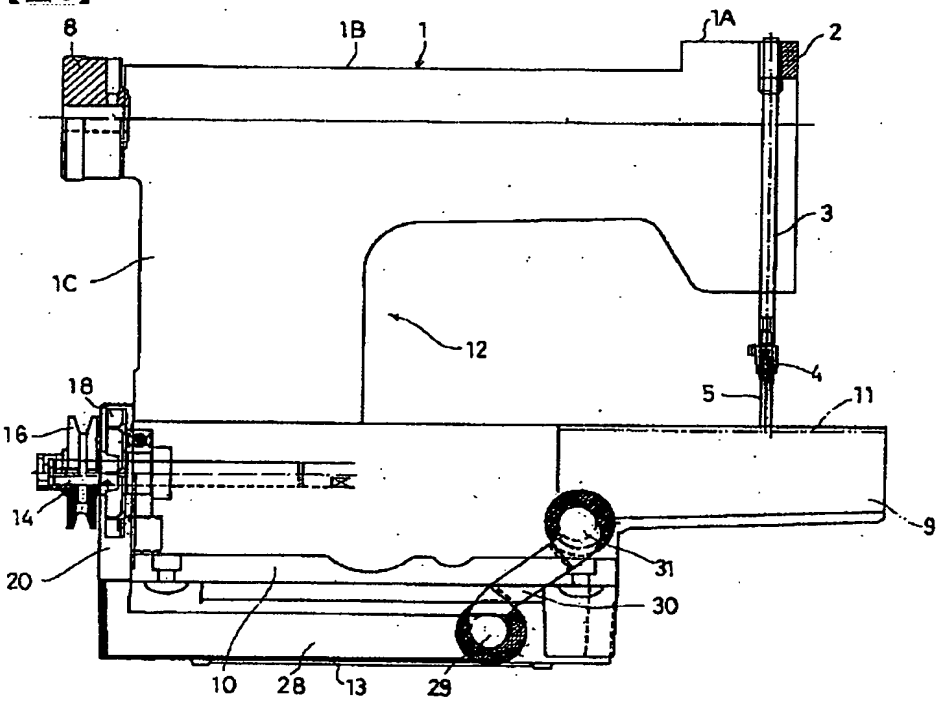
【図4】



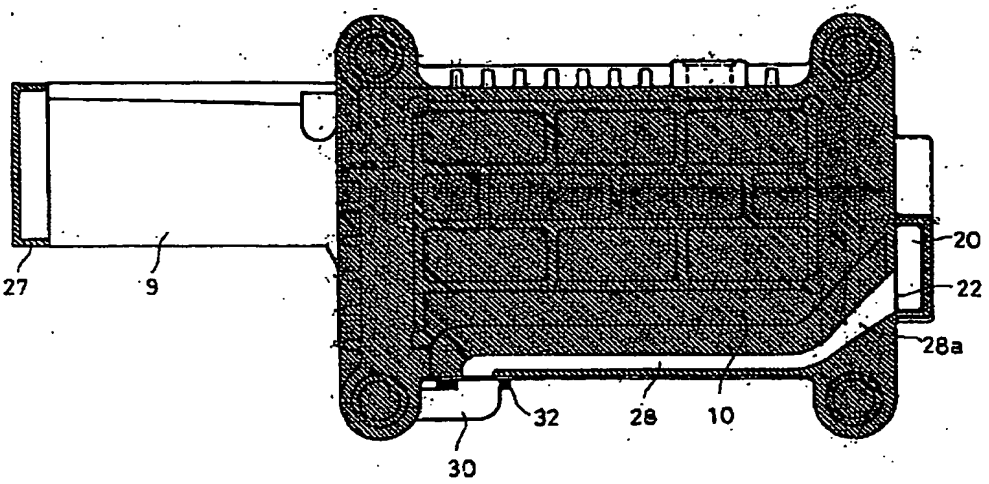
【図5】


1A
1
1C
9A
9
10
23
25
13

【図6】

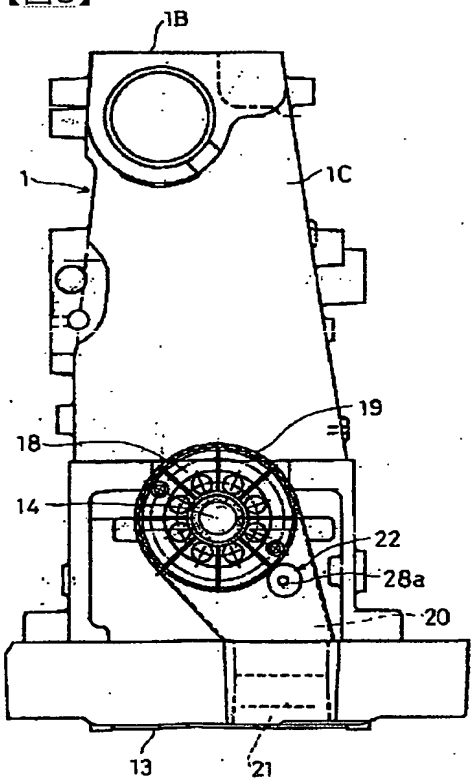

8
1B
1
1A
2
3
1C
12
4
5
11
18
16
14
9
31
20
30
10
28
13
29

【図7】



２８：内部空気流路
３０：短尺パイプ

【図８】



* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] While being located in the lower part of the body of a sewing machine and equipping the top-face section with the throat plate The sewing-machine bed section by which the components which constitute sewing inside are contained, and the lubricating oil stowage by which arrangement immobilization was carried out at the base lower part of this sewing-machine bed section, The sewing-machine main shaft with which it was made to project to the base side of the above-mentioned sewing-machine bed section, and the sewing-machine pulley was fixed to the lobe, In the sewing machine which comes to have the fan for cooling who is really fixed to this sewing-machine main shaft pivotable with the above-mentioned sewing-machine pulley, and feeds the airstream for cooling into the above-mentioned lubricating oil stowage While forming in the periphery section of the above-mentioned fan for cooling the airstream separation section for cooling into which a part of airstream for cooling which is generated by the above-mentioned fan for cooling, and is fed into the above-mentioned lubricating oil stowage is made to divide The sewing machine with a dust collector characterized by having prepared the airstream installation way which a part of airstreams for cooling separated in the airstream separation section for cooling are introduced [way] into the interior of the above-mentioned sewing-machine bed section, and gathers the dust of these sewing-machine bed circles in a predetermined part.
[Claim 2] The sewing machine with a dust collector according to claim 1 constituted with the pipe with which the above-mentioned airstream installation way made the above-mentioned airstream separation section for cooling, and the above-mentioned sewing-machine bed section make opening connection of the both ends, and was arranged along the tooth-back exterior of the base of the above-mentioned sewing-machine bed section.
[Claim 3] The sewing machine with a dust collector according to claim 1 from which the above-mentioned airstream installation way is constituted by the front end section of the passage formed in the interior of the base of the above-mentioned sewing-machine bed section, and its internal passage, and the above-mentioned sewing-machine bed section with the pipe which made opening connection.

[Translation done.]

* NOTICES *

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2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] Dust which generates this invention in detail about a sewing machine with a dust collector at the time of sewing, such as flat sewing by the tubed bed mold sewing machine or the flat tip bed sewing machine, such as waste thread and a rag, is related with the sewing machine with a dust collector which prevented generating of poor sewing by being accumulated in the lower part section of a throat plate, breakage of components, etc.
[0002]
[Description of the Prior Art] If it accumulates in the lower part section of the interior of the sewing-machine bed section where components for dust, such as waste thread generated at the time of sewing by the sewing machine, to have a throat plate in the top-face section, and constitute sewing of a looper, a cloth delivery device, the Metz device, etc. inside are contained, especially a throat plate It is not formed as predetermined, but for poor sewing, such as an eye jump, by are recording dust interfering with moving parts, such as a needle and a looper, if it becomes empty and it advances, these moving parts will be transformed or a needle thread loop formation will cause a lifting and the defect situation of being damaged. Although it is possible to use an air gun, to spray air on the sewing-machine bed section manually, and to carry out scattering removal of the dust in order to prevent generating of such poor sewing and the defect situation in this case, troublesome cleaning which the trouble of interrupting actuation of a sewing machine frequently and spraying air into sewing requires is not only required, but It is easy to cause decline in sewing efficiency, and the dust which dispersed in connection with blasting of air further is located on the perimeter of a sewing machine, and there is also a problem that a basket gets worse work environment.
[0003] Moreover, many things which are made to attract the dust generated in the sewing-machine bed section, and removed this dust from sewing-machine bed circles at the time of sewing are also known by making opening connection of the end suction opening of a duct or a pipe connected to aspirators, such as a vacuum pump and a suction blower, at sewing-machine bed circles as indicated by JP,1-86987,U, JP,1-121578,U, JP,6-72579,U, etc. However, in the case of these suction type dust collector, it is necessary to install an aspirator and its driving source separately from a sewing machine, and it has the problem that the whole facility will become very large-scale and expensive.
[0004] As a sewing machine which conquered many problems like the above, the thing of a configuration as indicated by the U.S. Pat. No. 5,454,338 specification is proposed. The sewing machine (the advanced technology is called hereafter) indicated by this U.S. Pat. No. 5,454,338 specification The fan who does a passage flow of the exterior air compulsorily to the radiator of the oil cooler for cooling the lubricating oil which carries out the lubrication of the interior of a sewing machine if it summarizes is prepared. By leading the airstream after being generated by this fan and making the radiator of an oil cooler carry out a passage flow to the interior of a sewing machine, it constitutes so that it may make it prevent that make the interior of a sewing machine hold to positive pressure, and dust, such as waste thread, trespasses upon the interior of a sewing machine.
[0005]
[Problem(s) to be Solved by the Invention] Since according to the advanced technology of the above configurations it is possible to demonstrate the invasion prevention function of the dust inside a sewing machine using the airstream generated by the fan for oil coolers with whom the sewing

machine is equipped essentially in order to cool a lubricating oil Trouble starts for trouble of interrupting sewing-machine actuation and spraying air into sewing like manual system dust removing mentioned above. And, cleaning which causes decline in sewing efficiency attaining miniaturization of the whole equipment, space-saving-izing, and low cost-ization unnecessarily compared with an above-mentioned suction type dust collector It has the advantage that deformation of poor sewing and moving parts accompanying are recording of dust and generating of the defect situation of breakage can be prevented.

[0006] However, after the case of the above-mentioned advanced technology made the radiator of an oil cooler carry out a passage flow of the airstream generated by the fan for oil coolers, Since it leads to the interior of a sewing machine, it is necessary to convert a sewing machine sharply for formation of the duct for leading the airstream after a passage flow to the interior of a sewing machine for the fan for oil coolers, and arrangement of a radiator and its radiator etc. Moreover, since the airstream introduced into the interior of a sewing machine is the airstream heated by heat exchange with a radiator The temperature rise of moving parts, such as a needle in the inclination which carries out a temperature rise gradually by friction accompanying sewing actuation etc., and a looper, was promoted, and there was a problem that the yarn which has it in a needle, a looper, etc. and a contact condition owing to tends to be cut by the contingency with heat.

[0007] The airstream generated by the fan for cooling originally prepared for cooling of a lubricating oil is utilized effectively, without having made this invention in view of the above actual condition, and requiring large reconstruction. While being able to prevent deformation of poor sewing and moving parts accompanying are recording of dust, and generating of the defect situation of breakage, it aims at offering the sewing machine with a dust collector which can be made to be also able to demonstrate the cooling function to moving parts, and can aim at improvement in the sewing engine performance and sewing quality.

[0008]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the sewing machine with a dust collector concerning invention of claim 1 While being located in the lower part of the body of a sewing machine and equipping the top-face section with the throat plate The sewing-machine bed section by which the components which constitute sewing inside are contained, and the lubricating oil stowage by which arrangement immobilization was carried out at the base lower part of this sewing-machine bed section, The sewing-machine main shaft with which it was made to project to the base side of the above-mentioned sewing-machine bed section, and the sewing-machine pulley was fixed to the lobe, In the sewing machine which comes to have the fan for cooling who is really fixed to this sewing-machine main shaft pivotable with the above-mentioned sewing-machine pulley, and feeds the airstream for cooling into the above-mentioned lubricating oil stowage While forming in the periphery section of the above-mentioned fan for cooling the airstream separation section for cooling into which a part of airstream for cooling which is generated by the above-mentioned fan for cooling, and is fed into the above-mentioned lubricating oil stowage is made to divide It is characterized by having prepared the airstream installation way which a part of airstreams for cooling separated in the airstream separation section for cooling are introduced [way] into the interior of the above-mentioned sewing-machine bed section, and gathers the dust of these sewing-machine bed circles in a predetermined part.

[0009] While according to invention of the above configurations according to claim 1 the mainstream of the airstreams for cooling generated by the fan for cooling who a sewing-machine pulley and really rotates at the time of sewing will be fed into a lubricating oil stowage as usual and the lubricating oil in this stowage will be cooled A part of airstreams for cooling separated from the mainstream are introduced into sewing-machine bed circles through an airstream installation way. Dust, such as waste thread which invades into sewing-machine bed circles, gathers the predetermined part of these sewing-machine bed circles, i.e., near the clearance airstream begins to leak outside from sewing-machine bed circles, and is removed from the lower part section of a throat plate by a part of the introduced airstream for cooling. While it is possible to prevent generating of the defect situation of interfering with the dust with which moving parts accompanying dust being accumulated in the lower part section of a throat plate, such as generating and the needle of poor sewing, and a looper, were accumulated, and these moving parts deforming or damaging by this

Since the airstream which achieves such a dust collection function is airstream with the low temperature generated by the fan for cooling The yarn which demonstrates the function which cools moving parts in the inclination which carries out a temperature rise gradually, such as a needle and a looper, and contacts these moving parts by friction accompanying sewing actuation etc. is able to prevent generating of the trouble of being cut by the contingency with heat. Moreover, since it considered as the gestalt which make separate a part of airstream for cooling generated by the above-mentioned fan for cooling, and introduces into the sewing-machine bed section, it is possible in demonstrating the dust-removing function and the cooling function which mentioned above as little reconstruction which adds the airstream separation section and its airstream installation way to this kind that did not need to convert the whole sewing machine sharply and was equipped with the fan for cooling of sewing machine is also.

[0010] In the sewing machine with a dust collector concerning invention given in above-mentioned claim 1, as the above-mentioned airstream installation way, as indicated at claim 2 When the pipe which the above-mentioned airstream separation section for cooling and the above-mentioned sewing-machine bed section were made to make opening connection, and was arranged in them along the tooth-back exterior of the base of the above-mentioned sewing-machine bed section constitutes the both ends It is not necessary to convert greatly the internal structure of the base of the sewing-machine bed section, and the airstream separation section and a pipe are added. **** which makes opening connection of the end section of the pipe at the tooth back of the sewing-machine bed section etc. -- it is possible to constitute to the sewing machine which demonstrates a dust-removing function and a cooling function predetermined only by performing easy reconstruction.

[0011] Moreover, it sets to the sewing machine with a dust collector concerning invention given in above-mentioned claim 1. As indicated to claim 3, when the pipe which made opening connection constitutes as the above-mentioned airstream installation way in the front end section of the passage formed in the interior of the base of the above-mentioned sewing-machine bed section, and its internal passage, and the above-mentioned sewing-machine bed section It is possible to consider as an advantageous configuration, when attaching various attachments in the flank of a sewing machine, while **** of the component part of an airstream installation way part is projects in the sewing-machine bed section and the tooth-back exterior of the base and being able to attain a miniaturization by the unification with a sewing machine.

[0012]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained based on a drawing. some three tubed bed mold needle [with a dust collector] flat sewing sewing machines which drawing 1 requires for this invention -- for a notch front view and drawing 2 , notch rear view and drawing 3 are [a part of the notch right side view and drawing 5 of a notch sectional view and drawing 4] notch left side views. [a part of] [a part of] [a part of] While 1 is the sewing-machine arm section and the needle bar 3 is supported by point 1lambda possible [a reciprocating motion] in the vertical direction through bearing 2 in these drawing 1 - drawing 5 , three needles 5 are attached in the lower limit section of this needle bar 3 through the pointer stop 4. Insertion support of the arm shaft horizontal 7 for a drive for making the interior of horizontal level 1B of the above-mentioned sewing-machine arm section 1 carry out both-way drive movement of the above-mentioned needle bar 3 up and down through the needle-bar drive 6 of the common knowledge prepared in the above-mentioned point 1A is carried out, and the hand wheel 8 is being fixed to the protrusion edge to the method of right-hand side of this arm shaft horizontal 7 for a drive.

[0013] 9 is the sewing-machine bed section and fixing successive formation is carried out at one at the tip of this sewing-machine arm section 1 and the base 10 installed in the parallel condition to the method of left-hand side from the lower part of end face section 1C of the above-mentioned sewing-machine arm section 1. While the throat plate 11 is being fixed to the top-face section of this sewing-machine bed section 9, inside, the components (since it is common knowledge, detailed explanation and illustration are omitted) for constituting sewing of a looper, a cloth delivery device, etc. are contained. The body 12 of a sewing machine of a flat sewing sewing machine is constituted by this sewing-machine bed section 9 and the above-mentioned sewing-machine arm section 1.

[0014] 13 is the lubricating oil stowage (generally it is called an oil pan mechanism and is hereafter

indicated as an oil pan mechanism) by which arrangement immobilization was carried out at the inferior-surface-of-tongue side of the above-mentioned base 10, and it is constituted so that cooling maintenance of the receipt lubricating oil may be carried out by indirect heat exchange with the airstream for cooling mentioned later. 14 is the sewing-machine main shaft bearing of the rotation of was made free through bearing 15 into the base 10 of the above-mentioned sewing-machine bed section 9, the right end section is projected to the method of right-hand side, and the sewing-machine pulley 16 which carries out the passivity of the drive turning effort by the motor outside drawing to. the protrusion right end section is being fixed. Interlocking connection of this sewing-machine main shaft 14 and the above-mentioned arm shaft horizontal 7 for a drive is carried out through the timing belt 17.

[0015] As 18 is the fan for cooling really fixed to the above-mentioned sewing-machine main shaft 14 pivotable with the above-mentioned sewing-machine pulley 16 and it is shown in drawing 1 - drawing 4 The fan casing 19 which is made to open wide towards the method of right-hand side, and encloses the above-mentioned fan's 18 periphery is attached in the rear face of end face section 1C of the above-mentioned sewing-machine arm section 1 depending on the method of right-hand side of the base 10 of the above-mentioned sewing-machine bed section 9. Free passage connection of the airstream path 20 for cooling formed of this fan casing 19 is made at the airstream accession department 21 formed in the posterior part of the above-mentioned oil pan mechanism 13. By this It is constituted so that it may be fed by the above-mentioned oil pan mechanism 13 through the above-mentioned airstream accession department 21 and a lubricating oil may be cooled by indirect heat exchange, as the airstream for cooling generated by rotation of the above-mentioned fan 18 shows the arrow head a of drawing 4 R> 4.

[0016] Free passage formation of the airstream separation section 22 for cooling into which a part of airstream for cooling generated by rotation of the above-mentioned fan 18 is made to divide back as the arrow head b of drawing 4 shows is carried out on the cooling air circulation way 20 formed of the above-mentioned fan casing 19 so that it may show clearly in drawing 3 and drawing 4 . While opening connection of the end face section of the pipe 23 arranged in the side edge section of this airstream separation section 22 for cooling along the tooth-back exterior of the base 10 of the above-mentioned sewing-machine bed section 9 is made Opening connection of the point of this pipe 23 is made through the flange 26 for airtight at the tooth-back section near the end face of the above-mentioned sewing-machine bed section 9. The airstream installation way 25 which introduces into internal 9A of the above-mentioned sewing-machine bed section 9 a part of airstreams for cooling separated in the above-mentioned airstream separation section 22 for cooling with this pipe 23 is constituted. In addition, 27 is covering attached in the point of the above-mentioned sewing-machine bed section 9 free [closing motion].

[0017] In the three tubed bed mold needle [with a dust collector] flat sewing sewing machine constituted as mentioned above While the drive turning effort by the motor outside drawing is transmitted to the sewing-machine main shaft 14 through the sewing-machine pulley 16 The turning effort of this sewing-machine main shaft 14 is transmitted to the arm shaft horizontal 7 for a drive through a timing belt 17. By this The components for constituting sewing of a looper, a cloth delivery device, etc. contained in the sewing-machine bed section 9 operate, and predetermined sewing is performed at the same time both-way drive movement of the above-mentioned needle bar 3 is carried out up and down through the needle-bar drive 6 and a needle 5 reciprocates in the vertical direction. As shown in the arrow head a of drawing 4 , the mainstream of the airstreams for cooling generated in the cooling air circulation way 20 by the fan 18 for cooling who the sewing-machine pulley 16 and really rotates with drive rotation of the above-mentioned sewing-machine main shaft 14 at the time of this sewing will be fed by the above-mentioned oil pan mechanism 13 through the airstream accession department 21 as usual, and will cool a lubricating oil by indirect heat exchange with a lubricating oil.

[0018] On the other hand, a part of airstream for cooling generated in the cooling air circulation way 20 with rotation of the above-mentioned fan 18 As the arrow head b of drawing 4 R> 4 showed, after separating into the airstream separation section 22 for cooling of the side, A part of the separated airstream for cooling is introduced into internal 9A of the sewing-machine bed section 9 through the airstream installation way 25 in a pipe 23. This internal 9lambda will be flowed toward the direction

of a point of the sewing-machine bed section 9, as the arrow head c of drawing 3 shows, and it will begin to leak outside from the minute clearance currently formed between the point of the sewing-machine bed section 9, and the closing motion covering 27. Dust, such as waste thread from the clearance by the side of a flow and tip to the direction of a point of the sewing-machine bed section 9 of a part of [in internal 9A of such the sewing-machine bed section 9] airstreams for cooling to the exterior which is generated at the time of sewing and invades in the sewing-machine bed section 9 beginning to leak, gathers near the clearance between the tips in this sewing-machine bed section 9, and is removed from the lower part section of a throat plate 11. It is not only possible to prevent generating of the defect situations, such as deformation of moving parts and breakage, by interference with moving parts, such as generating and the needle of poor sewing accompanying dust being accumulated in the lower part section of a throat plate 11, and a looper, and are recording dust by this, but Since the airstream which achieves such a dust collection function is airstream with the low temperature generated by the fan 18 for cooling The yarn which also demonstrates the cooling function to moving parts in the inclination which carries out a temperature rise gradually, such as a needle and a looper, and contacts these moving parts by friction accompanying sewing actuation etc. is able to prevent generating of the trouble of being cut by the contingency with heat.

[0019] Moreover, since it considered as the gestalt which is made to separate a part of airstream for cooling generated by the above-mentioned fan 18 for cooling with whom this flat sewing sewing machine is equipped essentially for cooling of a lubricating oil, and is introduced in the sewing-machine bed section 9 Compared with the thing of the above-mentioned advanced technology he is trying to send all the airstreams for cooling after a passage flow into the interior of a sewing machine, the radiator of an oil cooler has little reconstruction of the whole sewing machine, and it lives in it. The airstream separation section 22 by which free passage connection is made is formed in the cooling air circulation way 20 at the fan casing 19 which is installed so that the periphery of the fan 18 for cooling may be surrounded, and forms the cooling air circulation way 20, It is possible to demonstrate a dust-removing function and a cooling function which were mentioned above as little reconstruction which newly attaches the pipe 23 for forming the airstream installation way 25 connected to this airstream separation section 22 and the sewing-machine bed section 9 is also.

[0020] In addition, it is possible not to leave the massive dust, but to take it out easily, and to carry out **** processing by dust's, such as waste thread's which gathered near the clearance between the tips in the sewing-machine bed section 9 by flow of the airstream for cooling separated at the time of sewing, being massive, and opening the above-mentioned closing motion covering 27 after sewing.

[0021] the part which shows the gestalt of other operations of the three tubed bed mold needle [with a dust collector] flat sewing sewing machine which drawing 6 - drawing 8 require for this invention -- notch rear view -- And it is a notch right side view a part. a part -- a notch bottom view -- with the gestalt of this operation The airstream way 28 in alignment with a cross direction is formed in the end side of the direction of breadth inside the base 10 of the above-mentioned sewing-machine bed section 9. While forming the airstream separation section 22 by [by the side of the back end of this internal airstream way 28] making 28a crooked in the inner direction in part, and making opening connection on the above-mentioned cooling air circulation way 20 The tooth-back section near the back end of the above-mentioned sewing-machine bed section 9 is made to make opening connection of the front end section of the short length pipe 30 which made the front end section of the above-mentioned internal airstream way 28 make opening connection through the flange 29 for airtight through the flange 31 for airtight. The airstream installation way 32 which introduces into internal 9A of the above-mentioned sewing-machine bed section 9 a part of airstreams for cooling separated in the above-mentioned airstream separation section 22 for cooling with the internal airstream way 28 and the above-mentioned short length pipe 30 of formation to the interior of the base 10 of the above-mentioned sewing-machine bed section 9 is constituted. Other configurations Since it is the same as that of the gestalt of the above-mentioned implementation shown in drawing 1 R> 1 - drawing 5 , the same sign is given to an applicable part and those detailed explanation is omitted.

[0022] Also in the three tubed bed mold needle [with a dust collector] flat sewing sewing machine by the gestalt of operation shown by drawing 6 - drawing 8 After a part of airstream for cooling generated in the cooling air circulation way 20 with rotation of the fan 18 for cooling was separated in the airstream separation section 22 for cooling like the case of the gestalt of operation shown in

above-mentioned drawing 1 - drawing 5 , It will be introduced into internal 9lambda of the sewing-machine bed section 9 through the airstream installation way 25 where a part of the separated airstream for cooling is constituted with the internal airstream way 28 and the short length pipe 30. By this Make dust, such as waste thread generated at the time of sewing, remove from the lower part section of a throat plate 11, and it is made to gather near the clearance between the tips in the sewing-machine bed section 9. While it is possible to prevent generating of the defect situations, such as deformation of moving parts and breakage, by interference with moving parts, such as generating and the needle of poor sewing accompanying are recording of dust, and a looper, and are recording dust Only by only the short length pipe 30 projecting in the side-face exterior of the sewing-machine bed section 9 to the top which can also demonstrate the cooling function to moving parts in the inclination which carries out a temperature rise gradually by friction accompanying sewing actuation etc., such as a needle and a looper It is possible to consider as an advantageous configuration, when attaching various attachments in the flank of a sewing machine, while becoming the configuration united with the sewing machine and being able to attain a miniaturization structurally.

[0023]

[Effect of the Invention] As mentioned above, by according to invention according to claim 1, making a part separate among the airstreams for cooling generated by the fan for cooling with whom the sewing machine is equipped essentially for cooling of a lubricating oil, and introducing a part of the separated airstream for cooling into sewing-machine bed circles The location which is distant from the lower part section of a throat plate without storing up dust, such as waste thread which invades into sewing-machine bed circles at the time of sewing, in the lower part section of a throat plate is gathered. Deformation of the moving parts by interference with moving parts, such as generating and the needle of poor sewing accompanying dust being accumulated in the lower part section of a throat plate, and a looper, and are recording dust and generating of the defect situation of breakage can be prevented certainly. And since the airstream which achieves such a dust-removing (dust collection) function is low-temperature airstream With heat, the yarn which is made to demonstrate the cooling function to moving parts in the inclination which carries out a temperature rise gradually, such as a needle and a looper, and contacts these moving parts by friction accompanying sewing actuation etc. can also prevent generating of the trouble of being cut by the contingency, and follows. By having considered as the gestalt which is made to separate a part of airstream for cooling generated by the above-mentioned fan for cooling, and is introduced into the sewing-machine bed section Constituting the whole from little reconstruction which adds the airstream separation section and its airstream installation way to this kind that did not need to convert the whole sewing machine sharply and was equipped with the fan for cooling of sewing machine cheaply and small A dust-removing function and a cooling function which were mentioned above are demonstrated, and the effectiveness that improvement in the sewing engine performance and sewing quality can be aimed at is done so.

[0024] moreover -- according to invention according to claim 2 -- an effect of the invention given in above-mentioned claim 1 -- in addition, the internal structure of the base of the sewing-machine bed section -- large -- it is not necessary to convert -- the airstream separation section and a pipe -- adding -- **** which makes opening connection of the end section of the pipe on the side face of the sewing-machine bed section etc. -- it can constitute to the sewing machine which demonstrates a dust-removing function and a cooling function predetermined only by performing easy reconstruction.

[0025] Furthermore, while it is possible to consider only as the configuration to which some component parts of the airstream installation way for introducing [according to invention according to claim 3] the separated airstream for cooling into the sewing-machine bed section in addition to an effect of the invention according to claim 1 project in the sewing-machine bed section and the side-face exterior of the base and being able to attain a miniaturization by the unification with a sewing machine, when attaching various attachments in the flank of a sewing machine, it can consider as an advantageous configuration.

[Translation done.]

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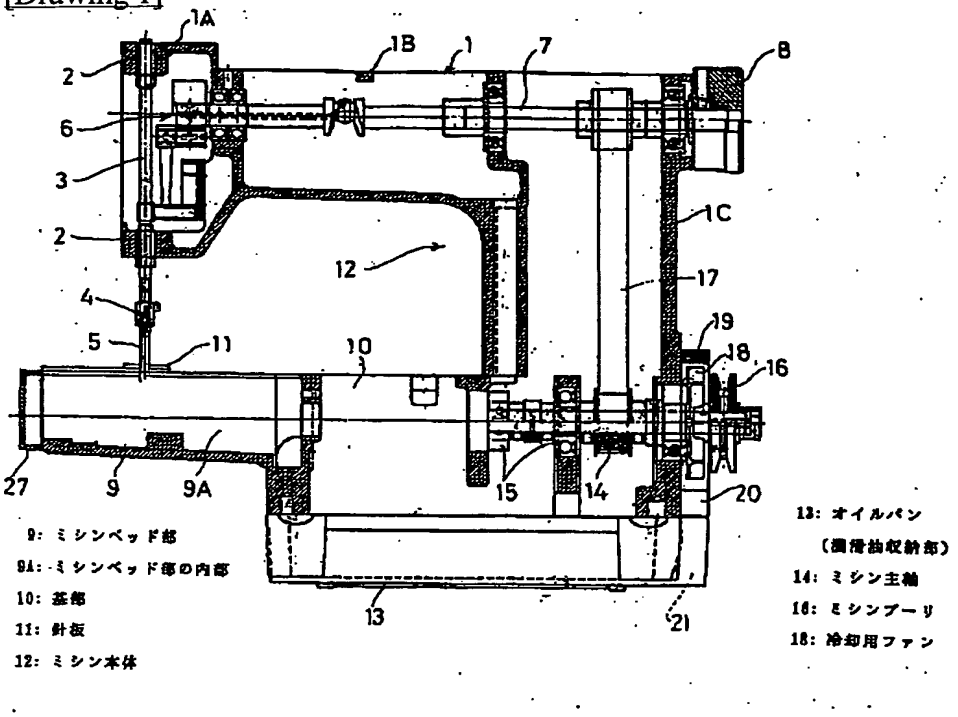
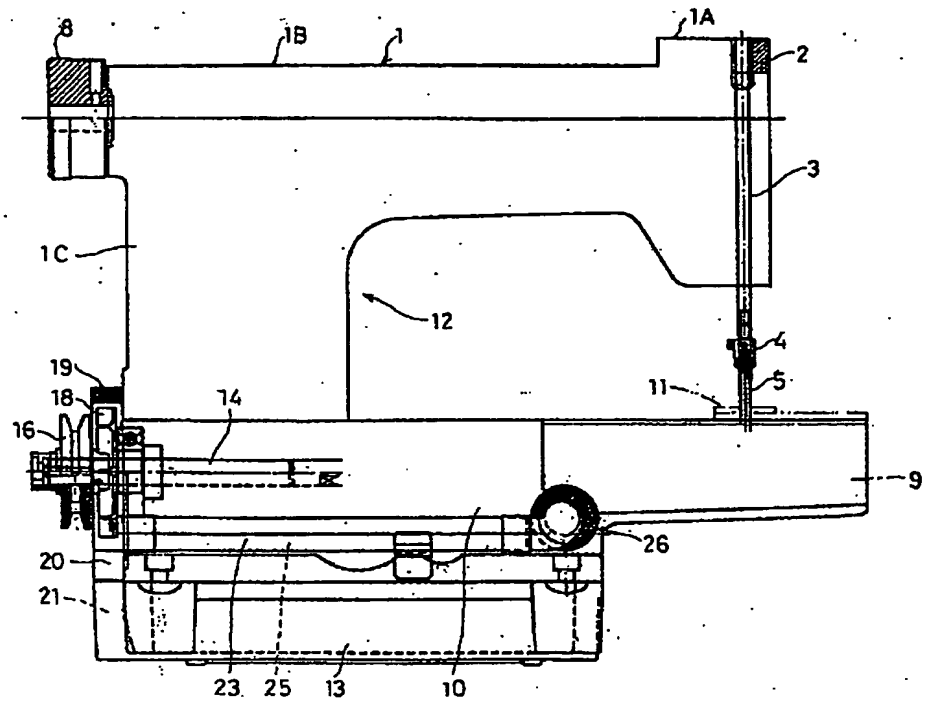
DRAWINGS

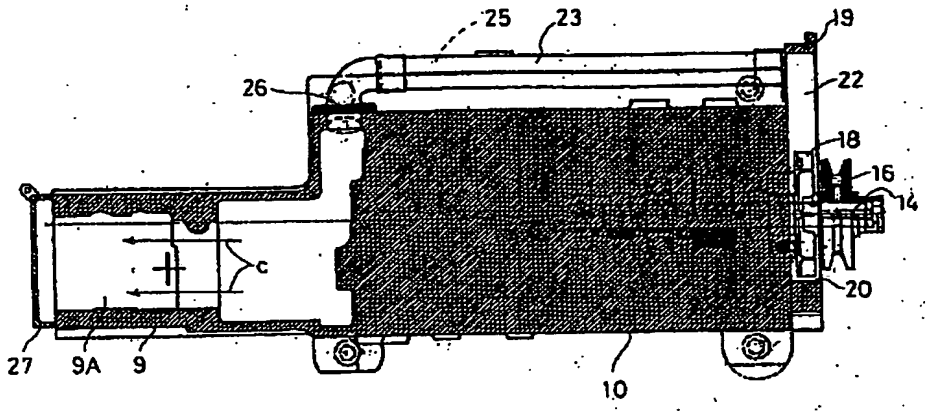
[Drawing 1]



[Drawing 2]

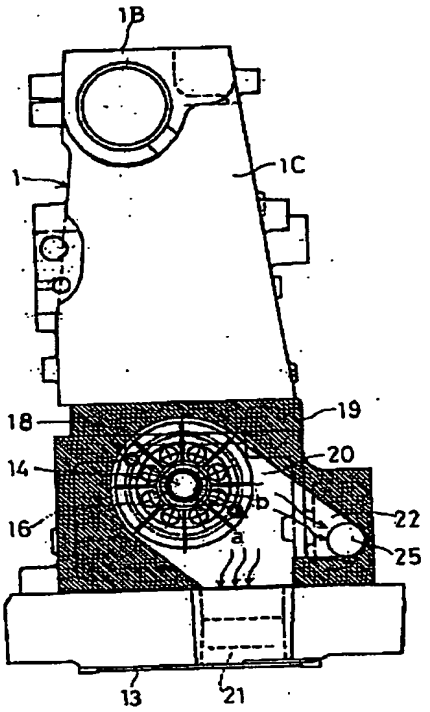


[Drawing 3]



２２：冷却用空気流分岐部
２３：パイプ
２５：空気流導入路

[Drawing 4]



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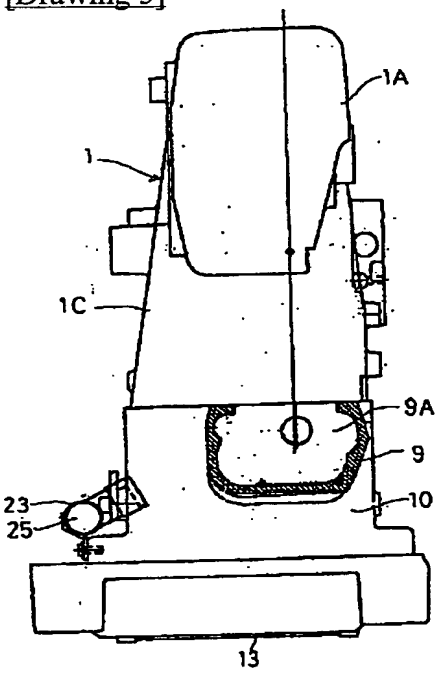

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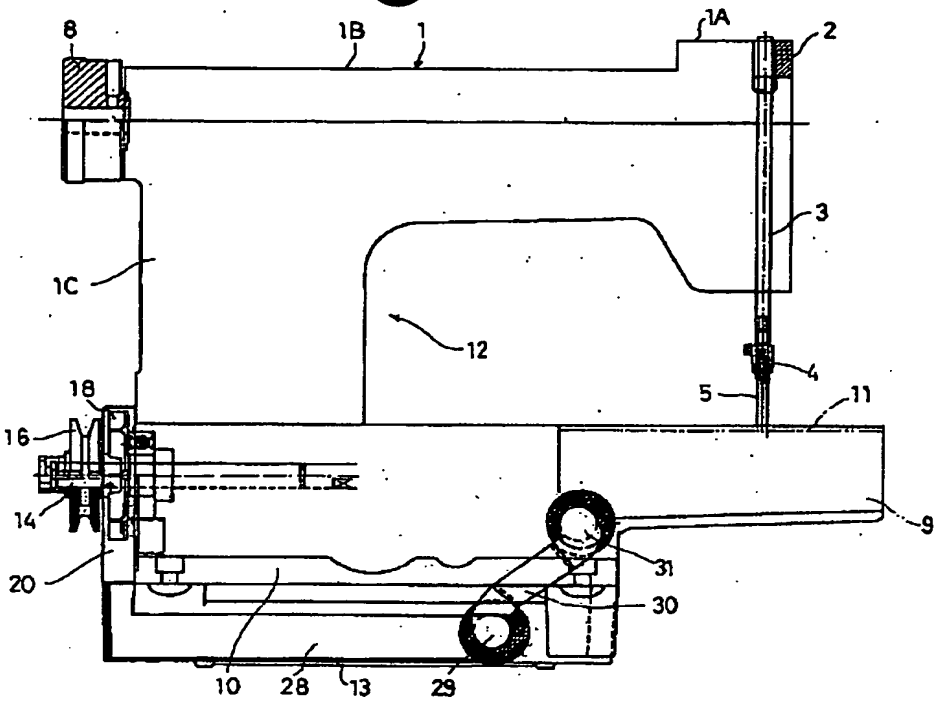
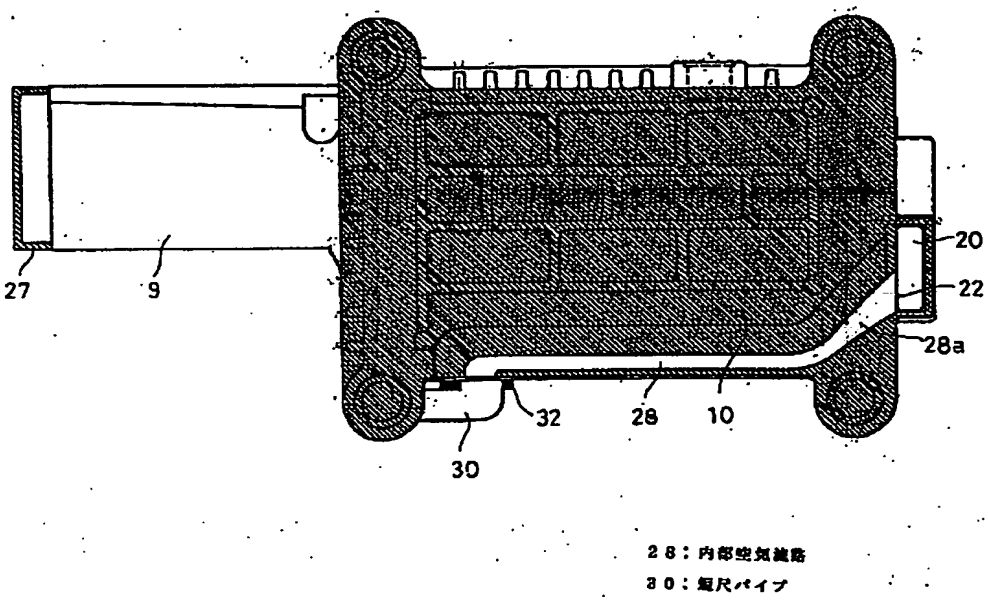
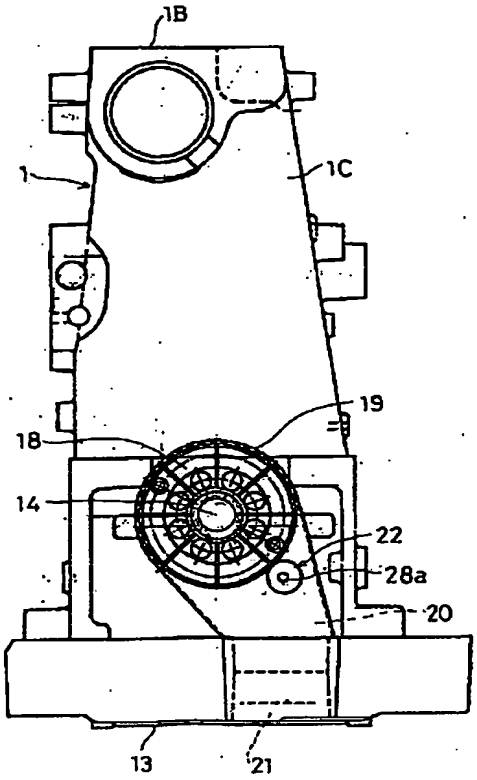


[Drawing 7]



[Drawing 8]



[Translation done.]